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HAIR COSMETICS

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[There are no amendments to this patent]

## Abstract

### Objective

To provide hair cosmetics having excellent dandruff-prevention effects.

### Constitution

Hair cosmetics containing one or more chosen from lactic acid and pyrrolidonecarboxylic acid and salts thereof and one or more of dandruff-preventing drugs.

## Claims

1. Hair cosmetic, characterized by containing one or more ingredient chosen from lactic acid and pyrrolidonecarboxylic acid and salts thereof and one or more of dandruff-preventing drugs.

2. Hair cosmetic according to Claim 1, characterized by the dandruff-preventing drug being one or more chosen from zinc pyrithione, triclosan, trichlorocarbanilide, dipotassium glycyrrhizinate, monoammonium glycyrrhizinate,  $\beta$ -glycyrrhizinic acid, allantoin, sulfur, biosarufa furido [transliteration], isopropylmethylphenol, and salicylic acid.

3. Hair cosmetic according to Claims 1 and 2, characterized by the fact that the salts of the lactic acid and pyrrolidonecarboxylic acid are potassium salts, sodium salts, lithium salts, calcium salts, and magnesium salts.

4. Hair cosmetic according to Claims 1-3, characterized by the content of one or more of the lactic acid and pyrrolidonecarboxylic acid and salts thereof being 0.001-5.0 wt% of the overall hair cosmetic.

5. Hair cosmetic according to Claims 1-4, characterized by the content of one or more of dandruff-preventing drug is 0.0001-5.0 wt% of the overall hair cosmetic.

## Detailed explanation of the invention

[0001]

### Industrial application field

The present invention concerns hair cosmetics, more specifically concerns dandruff-preventing hair cosmetics such as hair shampoo, hair rinse, hair treatment, hair liquid, hair cream, hair spray, hair tonic, etc.

[0002]

### Prior art and its problems

In general, dandruff comprises fat gland secretions, sweat gland secretions and peeled surface materials, and is usually formed by accelerated secretion of the fat gland, etc., and when

skin is infected by bacteria, the dandruff formation becomes a disease. Thus, conventionally, hair cosmetics containing antibacterial materials and bactericides are used for prevention. For example, antibacterial materials such as zinc pyrithione, triclosan, etc., have been used as preventive drugs. However, their preventive effects have not been satisfactory. Some antibacterial materials have to be used in large amounts, and safety and stability have become problems.

[0003]

Means for solving the problems

As a result of an intense study for solving such technical problems, we have discovered that hair cosmetics containing one or more of lactic acid and pyrrolidonecarboxylic acids and salts thereof and one or more of dandruff-prevention drugs show markedly improved dandruff-prevention effects, and the amount of dandruff-prevention drugs used can be significantly reduced. The present invention is based on such a discovery.

[0004]

Namely, the present invention concerns hair cosmetics containing one or more chosen from lactic acid and pyrrolidonecarboxylic acid and salts thereof and one or more of dandruff-preventing drugs.

[0005]

Next, the constitution of the present invention is described in detail. The lactic acid and pyrrolidonecarboxylic acid and salts thereof that can be used in the present invention can be chosen from those commonly used in the field of cosmetics. Specific examples of the lactic acid, pyrrolidonecarboxylic acid and salts thereof that can be used in the present invention include lactic acid, pyrrolidonecarboxylic acid, potassium lactate, sodium lactate, lithium lactate, calcium lactate, magnesium lactate, potassium pyrrolidonecarboxylate, sodium pyrrolidonecarboxylate, lithium pyrrolidonecarboxylate, calcium pyrrolidonecarboxylate, magnesium pyrrolidonecarboxylate, etc. In the present invention, they may be used singly or as mixtures thereof. In the hair cosmetics of the present invention, lactic acid salts and pyrrolidonecarboxylates are preferred. The content of the lactic acid, pyrrolidonecarboxylic acid and salts thereof used in the hair cosmetics of the present invention should be 0.001-5.0 wt%, preferably 0.005-1.0 wt% of the overall hair cosmetics. Below 0.001 wt%, sufficient dandruff-prevention effects are not realized, while above 5.0 wt%, no additional benefits can be realized.

[0006]

The dandruff-prevention drugs that can be used in the hair cosmetics of the present invention are, e.g., zinc pyrithione, triclosan, trichlorocarbanilide, dipotassium glycyrrhizinate, monoammonium glycyrrhizinate,  $\beta$ -glycyrrhizinic acid, allantoin, sulfur, biosarufa furido, isopropylmethylphenol, salicylic acid, etc. In the hair cosmetics of the present invention, they may be used singly or as mixtures of thereof. The content of such dandruff-preventing drugs used in the hair cosmetics of the present invention should be 0.0001-5.0 wt%, preferably 0.0005-1.0 wt%. Below 0.0001 wt%, sufficient improvement in dandruff prevention is not realized, while above 5.0 wt%, there will be problems of safety and stability, thus this is not favored.

[0007]

Beside such essential components, the hair cosmetics of the present invention may also contain, as needed, various additives that are commonly used in hair cosmetics, e.g., surfactants, antiseptics, antioxidants, humectants, perfume, oils, chelating agents, colorants, freshness agents, dyes, UV absorbers, etc. They should be used in an amount that does not adversely affect the effects of the present invention, of course.

[0008]

The hair cosmetics of the present invention are for use on hair as well as scalp, such as shampoo, hair rinse, hair liquid, hair tonic, hair cream, hair spray, scalp tonic, etc.

[0009]

#### Application examples

Next, the present invention is explained in detail with examples. However, the present invention is not limited to such examples. In all cases, the compounding amount is by wt%.

[0010]

Hair tonics were prepared as shown in Application Examples 1-25 and Comparative Examples 1-18 of Tables 1-9 and measured for dandruff-prevention effects. Results are given in the tables.

[0011]

#### Dandruff-prevention effect measurement

A partial application test was carried out as shown below for a panel of 75 men 22-50 years of age, having relatively heavy dandruff. Each sample was subjected to a practical

application test for 5 panel members. For one month as the control period, hair was shampooed once a day using the shampoo not containing the drug and groomed using the hair tonic not containing the drug. The accumulated dandruff was collected twice a week and measurement was made for the protein in the dandruff collected. During the subsequent test period, the hair tonics of the application example and comparative example were used once a day for a month, shampooing, grooming, collection of the accumulated dandruff, and measurement for protein in the dandruff collected [were conducted] as for the control period. Per panel member, the average protein content in the dandruff during the control period was compared with that during the test period, and the average reduction was obtained for the dandruff-prevention effect. The evaluation standards are given below.

- A ... above 50% protein reduction in dandruff
- B ... 40-50% protein reduction in dandruff
- C ... 20-40% protein reduction in dandruff
- D ... less than 20% protein reduction in dandruff

[0012]

Table 1

	実施例 ⑨					
	1	2	3	4	5	6
乳酸ナトリウム ①	1.0	1.0	1.0	—	—	—
ピロリン酸ナトリウム ②	—	—	—	1.0	1.0	1.0
ジンクピリチオン ③	0.1	—	—	0.1	—	—
トリクロロカルバニリド ④	—	0.2	—	—	0.2	—
グリチルリチン酸ナトリウム ⑤	—	—	0.1	—	—	0.1
エタノール ⑥	75.0	75.0	75.0	75.0	75.0	75.0
精製水 ⑦	残余	残余	残余	残余	残余	残余
ふけ防止効果 ⑧	B	A	A	B	A	A

- Key: 1 Sodium lactate  
 2 Sodium pyrrolidonecarboxylate  
 3 Zinc pyrithione  
 4 Trichlorocarbanilide  
 5 Dipotassium glycyrrhizinate  
 6 Ethanol  
 7 Purified water  
 8 Dandruff-prevention effect  
 9 Application Example  
 10 Balance

[0013]

Table 2

	⑩ 実施例				
	7	8	9	10	11
乳酸ナトリウム ①	1.0	1.0	1.0	1.0	1.0
グリチルリチン酸モノアモニウム ②	0.1	—	—	—	—
β-グリチルリチン酸 ③	—	0.1	—	—	—
アラントイン ④	—	—	0.1	—	—
イオウ ⑤	—	—	—	0.1	—
ビオサルフ - フリド ⑥	—	—	—	—	0.1
エタノール ⑦	75.0	75.0	75.0	75.0	75.0
精製水 ⑧	残余	残余	残余	残余	残余
ふけ防止効果 ⑨	B	B	B	B	B

- Key: 1 Sodium lactate  
 2 Monoammonium glycyrrhizinate  
 3 β-Glycyrrhizietic acid  
 4 Allantoin  
 5 Sulfur  
 6 Biosarufa furido [transliteration]  
 7 Ethanol

- 8 Purified water  
 9 Dandruff-prevention effect  
 10 Application Example  
 11 Balance

[0014]

Table 3

	実施例 ⑧				
	1 2	1 3	1 4	1 5	1 6
乳酸ナトリウム ①	1.0	1.0	0.001	0.005	1.0
イソプロピルメチルフェノール ②	0.1	—	—	—	—
サリチル酸 ③	—	0.1	—	—	—
ジカリウムグリチルリジン酸 ④	—	—	0.1	0.1	0.1
エタノール ⑤	75.0	75.0	75.0	75.0	75.0
精製水 ⑥	残余	残余	残余	残余	残余 ⑨
ふけ防止効果 ⑦	B	B	B	A	A

- Key: 1 Sodium lactate  
 2 Isopropylmethylphenol  
 3 Salicylic acid  
 4 Dipotassium glycyrrhizinate  
 5 Ethanol  
 6 Purified water  
 7 Dandruff-prevention effect  
 8 Application Example  
 9 Balance



[0015]

Table 4

	実施例 ⑥		
	17	18	19
乳酸ナトリウム ①	1.0	1.0	1.0
グリチルリチン酸ジカリウム ②	0.0001	0.0005	1.0
エタノール ③	75.0	75.0	75.0
精製水 ④	残余	残余	残余
ふけ防止効果 ⑤	B	A	A

- Key:
- 1 Sodium lactate
  - 2 Dipotassium glycyrrhizinate
  - 3 Ethanol
  - 4 Purified water
  - 5 Dandruff-prevention effect
  - 6 Application Example
  - 7 Balance

[0016]

Table 5

	⑬ 実施例					
	20	21	22	23	24	25
乳酸 ①	1.0	—	—	—	—	—
ピロリドンカルボン酸 ②	—	1.0	—	—	—	—
乳酸カリウム ③	—	—	1.0	—	—	—
ピロリドンカルボン酸カルシウム ④	—	—	—	1.0	—	—
乳酸マグネシウム ⑤	—	—	—	—	1.0	—
乳酸リチウム ⑥	—	—	—	—	—	1.0
ジンクピリチオン ⑦	0.1	—	—	0.1	—	—
トリクロロカルバニリド ⑧	—	0.2	—	—	0.2	—
トリポリリン酸カリウム ⑨	—	—	0.1	—	—	0.1
エタノール ⑩	75.0	75.0	75.0	75.0	75.0	75.0
精製水 ⑪	残余	残余	残余	残余	残余	残余
ふけ防止効果 ⑫	B	B	A	B	A	A

- Key:
- 1 Lactic acid
  - 2 Pyrrolidonecarboxylic acid
  - 3 Potassium lactate
  - 4 Calcium pyrrolidonecarboxylate
  - 5 Magnesium lactate
  - 6 Lithium lactate
  - 7 Zinc pyrithione
  - 8 Trichlorocarbanilide
  - 9 Dipotassium glycyrrhizinate
  - 10 Ethanol
  - 11 Purified water
  - 12 Dandruff-prevention effect
  - 13 Application Example
  - 14 Balance

[0017]

Table 6

	比較例 ⑩					
	1	2	3	4	5	6
ジンクピリチオン ①	0.1	—	—	—	—	—
トリクロロカルバニリド ②	—	0.2	—	—	—	—
グリチルリチン 酸ポタシウム ③	—	—	0.1	—	—	—
グリチルリチン 酸モノアモニウム ④	—	—	—	0.1	—	—
β-グリチルリチン 酸 ⑤	—	—	—	—	0.1	—
アラントイン ⑥	—	—	—	—	—	0.1
エタノール ⑦	75.0	75.0	75.0	75.0	75.0	75.0
精製水 ⑧	残余	残余	残余	残余	残余	残余 ⑪
ふけ防止効果 ⑨	C	C	C	D	D	D

- Key:
- 1 Zinc pyrithione
  - 2 Trichlorocarbanilide
  - 3 Dipotassium glycyrrhizinate
  - 4 Monoammonium glycyrrhizinate
  - 5 β-Glycyrrhizietic acid
  - 6 Allantoin
  - 7 Ethanol
  - 8 Purified water
  - 9 Dandruff-prevention effect
  - 10 Comparative Example
  - 11 Balance

[0018]

Table 7

	比較例 ⑧			
	7	8	9	10
イオウ ①	0.1	—	—	—
ビオサルフール・フリッド ②	—	0.1	—	—
イソプロピルメチルフェノール ③	—	—	0.1	—
サリチル酸 ④	—	—	—	0.1
エタノール ⑤	75.0	75.0	75.0	75.0
精製水 ⑥	残余	残余	残余	残余 ⑨
ふけ防止効果 ⑦	D	C	D	D

- Key:
- 1 Sulfur
  - 2 Biosarufa furido
  - 3 Isopropylmethylphenol
  - 4 Salicylic acid
  - 5 Ethanol
  - 6 Purified water
  - 7 Dandruff-prevention effect
  - 8 Comparative Example
  - 9 Balance

[0019]

Table 8

		比較例 ⑦			
		1 1	1 2	1 3	1 4
乳酸ナトリウム ①	①	0.1	—	0.0001	1.0
ピロリドンカルボン酸ナトリウム ②	②	—	0.1	—	—
グリチルリチン酸ジカリウム ③	③	—	—	0.1	0.00001
エタノール ④	④	75.0	75.0	75.0	75.0
精製水 ⑤	⑤	残余	残余	残余	残余
ふけ防止効果 ⑥	⑥	D	D	C	D

- Key:
- 1 Sodium lactate
  - 2 Sodium pyrrolidonecarboxylate
  - 3 Dipotassium glycyrrhizinate
  - 4 Ethanol
  - 5 Purified water
  - 6 Dandruff-prevention effect
  - 7 Comparative Example
  - 8 Balance

[0020]

Table 9

	比較例(11)			
	15	16	17	18
クエン酸 ①	1.0	—	—	—
リン酸 ②	—	1.0	—	—
クエン酸ナトリウム ③	—	—	1.0	—
リン酸ナトリウム ④	—	—	—	1.0
ジンクピリチオン ⑤	0.1	—	—	1.0
トリクロロカルバニリド ⑥	—	0.2	—	—
グリチルリチン 酸ジカリウム ⑦	—	—	0.1	—
エタノール ⑧	75.0	75.0	75.0	75.0
精製水 ⑨	残余	残余	残余	残余 ⑫
ふけ防止効果 ⑩	C	C	C	C

- Key:
- 1 Citric acid
  - 2 Phosphoric acid
  - 3 Sodium citrate
  - 4 Sodium phosphate
  - 5 Zinc pyrithione
  - 6 Trichlorocarbanilide
  - 7 Dipotassium glycyrrhizinate
  - 8 Ethanol
  - 9 Purified water
  - 10 Dandruff-prevention effect
  - 11 Comparative Example
  - 12 Balance

[0021]

As shown by the results of Tables 1-9, those containing one or more chosen from lactic acid and pyrrolidonecarboxylic acid and salts thereof and one or more of dandruff-preventing drugs showed excellent dandruff-prevention effects.

[0022]

Application Example 7

Hair shampoo

(1) sodium lauroylmethyltaurate	10.0
(2) lauric acid diethanolamide	3.0
(3) ethylene glycol fatty acid ester	1.5
(4) sodium lactate	0.1
(5) trichlorocarbanilide	0.1
(6) perfume	0.3
(7) purified water	balance

The hair shampoo prepared in the usual manner from the above ingredients showed excellent dandruff-prevention effects.

[0023]

Application Example 8

Hair shampoo

(1) polyoxyethylene (average E.O. addition: 3 mol)	10.0
lauryl sulfate sodium salt	4.0
(2) lauric acid diethanolamide	1.5
(3) ethylene glycol fatty acid ester	0.1
(4) sodium lactate	0.1
(5) triclosane	0.1
(6) perfume	0.1
(7) purified water	balance

The hair shampoo prepared in the usual manner from the above ingredients showed excellent dandruff-prevention effects.

[0024]

Application Example 10

## Hair rinse

(1) stearyltrimethylammonium chloride	2.0
(2) stearyl alcohol	1.0
(3) dipropylene glycol	5.0
(4) polyoxyethylene (average E.O. addition: 60 mol)	
hardened castor oil	0.5
(5) sodium pyrrolidonecarboxylate	0.1
(6) dipotassium glycyrrhizinate	0.1
(7) perfume	0.3
(8) purified water	balance

The hair rinse prepared in the usual manner from the above ingredients showed excellent dandruff-prevention effects.

[0025]

## Effect of the invention

The hair cosmetics of the present invention are excellent in dandruff prevention.



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